

9.3 Practice worksheet ANSWERS

- 1)(a) State Check (3)
- | | |
|----------------|--------------------------------------|
| 1) SRS | 1) Stated SRS |
| 2) $n > 30$ | 2) $n = 300 > 30$ |
| 3) $pop > 10n$ | 3) There are more than 3000 students |

(b)

$$\hat{p} = 115/300 = 0.383 \quad n = 300 \quad 95\% \text{ conf.}$$

$$0.383 \pm (1.96) \sqrt{\frac{(0.383)(0.617)}{300}} = (0.328, 0.438) \quad (1)$$

We are 95% confident that the true % of kids who copy HW regularly is between 32.8% and 43.8%.

(2)
Total: 8

2)

$$\hat{p} = 90/150 = 60\% \quad n = 150 \quad \text{Conf} = 97\% \quad Z^* = 2.17$$

$$0.60 \pm (2.576) \sqrt{\frac{(0.60)(0.40)}{150}} = (0.49696, 0.70304)$$

We are 99% confident that the true % of 16-21 year old drivers who have gotten at least 1 speeding ticket is between 49.696% and 70.304%.

- 3)(a) State Check (3)
- | | |
|----------------|---|
| 1) SRS | 1) stated SRS |
| 2) $n > 30$ | 2) $n = 100 > 30$ |
| 3) $pop > 10n$ | 3) There are more than 1000 American adults |

3) (b)

$$p = 0.20 \quad \hat{p} = 15/100 = 0.15 \quad n = 100 \quad \alpha = 0.05$$

Ho: $p = 0.20$ (2)
Ha: $p < 0.20$

$$Z = \frac{0.15 - 0.20}{\sqrt{\frac{(0.20)(0.80)}{100}}} = -1.25 \quad (1) \quad (15)$$

$$P(Z < -1.25) = 0.1056$$

We fail to reject Ho b/c p-value of $0.1056 > \alpha = 0.05$. We **do not** have sufficient evidence that the true % of adults over 40 years old who exercise regularly is less than 20% (4)

4) $p = 0.06$ $\hat{p} = 21/200 = 0.105$ $n = 200$ $\alpha = 0.08$

Ho: $p = 0.06$

Ha: $p \neq 0.06$

$$Z = \frac{0.105 - 0.06}{\sqrt{\frac{(0.06)(0.94)}{200}}} = 2.6797 \quad (\text{or } 2.68)$$

$$2 * P(Z > 2.6797) = 0.0074$$

We reject Ho b/c p-value of $0.0074 < \alpha = 0.08$. We have sufficient evidence that the true % of rats suffering serious side effects from the medication is not 6%.